

Application No.: 10/020,760

Docket No.: K2291.0107

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for measuring quality of service (QoS) provided by a network, over which ~~a block~~ one or more blocks of data each having at least source and destination addresses included therein ~~is~~ are transferred, the method comprising the steps of:

a) determining an ingress and an egress of the network based on the source and destination addresses of ~~the~~ an inflow block of data;

b) extracting first feature information from the inflow block of data at the ingress ~~and the egress~~, wherein the first feature information identifies the inflow block of data;

c) sending the first feature information from the ingress to the egress;

d) extracting second feature information from an outflow block of data at the egress, wherein the second feature information identifies the outflow block of data;

e) [c)] determining whether the first feature information extracted at the ingress matches the second feature information extracted at the egress; and

f) [d)] when the first feature information matches the second feature information, measuring QoS based on a matching pair of the first feature information and the second feature information.

2. (Currently Amended) The method according to claim 1, wherein at the ingress,

determining the egress to which the inflow block of data is forwarded from the ingress, based on the source and destination addresses of the inflow block of data; and

~~sending the first feature information to the egress,~~

wherein, at the egress, the steps ~~[[c)]~~ e) and ~~[[d)]~~ f) are performed.

3. (Currently Amended) The method according to claim 1, wherein the step b) comprises ~~the steps of:~~

stamping the inflow block of data with a first time stamp at the ingress;

and

stamping the outflow block of data with a second time stamp at the egress,

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wherein, in the step f) [d)] QoS is measured based on the first and second time stamps of the matching pair.

4. (Currently Amended) The method according to claim 1, further comprising the steps of:

registering the first and second feature information ~~extracted from the block of data~~ and its respective registration ~~time~~ times into a buffer;

when a matching pair is found in the step e) [c)], deleting feature information corresponding to the matching pair from the buffer; and

when feature information is left in the buffer after a predetermined lifetime expires, processing a block of data identified by the feature information as being lost.

5. (Currently Amended) The method according to claim 1, further comprising the step of:

determining whether ~~[[the]]~~ an inflow or outflow block of data is targeted for QoS measurement ~~at the ingress and egress~~,

wherein, only when the inflow or outflow block of data is targeted for QoS measurement, the step b) or d) is performed.

6. (Currently Amended) A system for measuring quality of service (QoS) provided by a network, over which ~~a block~~ one or more blocks of data each having at least source and destination addresses included therein ~~is~~ are transferred, the system comprising:

a feature information extractor for extracting first and second feature information from ~~the~~ an inflow and outflow block of data at an ingress and egress of the network, ~~which are~~ the ingress and egress being determined based on the source and destination addresses of the inflow block of data, wherein the first and second feature information identifies the inflow and outflow block of data, respectively;

a feature information sender for sending the first feature information to the egress,

a matching detector for detecting a matching pair of first feature information extracted at the ingress and second feature information extracted at the egress; and

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a quality measuring section for measuring QoS based on the matching pair of the first feature information and the second feature information.

7. (Currently Amended) The system according to claim 6, further comprising:

a determiner for determining the egress to which the inflow block of data is forwarded from the ingress, based on the source and destination addresses of the inflow block of data at the ingress; and

~~a feature information sender for sending the first feature information to the egress;~~

wherein the quality measuring section at the egress measures QoS ~~based on the matching pair~~ at the egress.

8. (Currently Amended) The system according to claim 6, further comprising:

a time stamper for stamping the inflow block of data with a first time stamp at the ingress and the outflow block of data with a second time stamp at the egress,

wherein the quality measuring section at the egress measures QoS based on the first and second time stamps of the matching pair.

9. (Currently Amended) The system according to claim 6, further comprising:

a buffer for registering the first and second feature information ~~extracted from the block of data and its~~ and respective registration time times; and

a controller for deleting feature information corresponding to the matching pair from the buffer when a matching pair is found,

wherein, when feature information is left in the buffer after a predetermined lifetime expires, the quality measuring section processes a block of data identified by the feature information as being lost.

10. (Currently Amended) The system according to claim 6, further comprising:

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a target determiner for determining whether ~~the~~ an inflow or outflow block of data is targeted for QoS measurement ~~at the ingress and the egress,~~

wherein, only when the inflow or outflow block of data is targeted for QoS measurement, the inflow or outflow block of data is output to the feature information extractor.

11. (Currently Amended) A method for measuring quality of service (QoS) provided by a network, over which ~~a block one or more blocks~~ of data each having at least source and destination addresses included therein ~~is~~ are transferred, the method comprising ~~the steps of:~~

at an ingress where a first block of data flows into the network,

a) extracting first feature data from the first block of data, wherein the first feature data identifies the first block of data;

b) determining an egress where the first block of data is to flow from the network, based on source and destination addresses of the first block of data;

c) sending the first feature data to the egress;

at the egress,

d) receiving the first feature data from the ingress;

e) extracting second feature data from a second block of data flowing from the network, wherein the second feature data identifies the second block of data;

f) comparing the second feature data with the first feature data to determine whether the second block of data is identical to the first block of data; and

g) when it is determined that the second block of data is identical to the first block of data, computing QoS based on the first and second feature data.

12. (Original) The method according to claim 11, wherein, in the step b), the egress is determined by referring to network configuration data indicating a correspondence between each ingress node and each egress node in the network.

13. (Original) The method according to claim 12, wherein the network configuration data further indicates a correspondence between each ingress node and each egress node via at least one via-point node in the network.

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14. (Currently Amended) The method according to claim 13, further comprising ~~the steps of:~~

at each of the at least one via-point node,

h) extracting third feature data from a third block of data passing through the via-point node, wherein the third feature data identifies the third block of data;

i) determining an egress where the third block of data is to flow from the network, based on source and destination addresses of the third block of data; and

j) sending the third feature data to the egress.

15. (Currently Amended) The method according to claim 13, further comprising ~~the steps of:~~

at a via-point node,

h) receiving the first feature data from the ingress;

i) extracting third feature data from a third block of data passing through the via-point node, wherein the third feature data identifies the third block of data;

j) comparing the third feature data with the first feature data to determine whether the third block of data is identical to the first block of data; and

k) when it is determined that the third block of data is identical to the first block of data, computing QoS based on the first and third data feature.

16. (Currently Amended) The method according to claim 14, further comprising ~~the steps of:~~

at the egress,

k) receiving the third feature data from each of the at least one via-point node;

l) when it is determined that the second block of data is identical to the first block of data, comparing the third feature data with the first feature data to determine whether the third block of data is identical to the first block of data; and

m) when it is determined that the third block of data ~~for~~ from each of the at least one via-point node is identical to the first block of data, computing QoS based on the first, second and third feature data.

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17. (Currently Amended) A measuring probe system for measuring quality of service (QoS) provided by a network, over which ~~a block~~ one or more blocks of data each having at least source and destination addresses included therein ~~is~~ are transferred, wherein a plurality of measuring probes are provided at edge nodes in the network, the measuring probes being interconnected to each other, the measuring system comprising:

a first feature data extractor for extracting first feature data from a first block of data flowing into the network, wherein the first feature data identifies the first block of data;

a destination discriminator for determining an exit measuring probe at a point where the first block of data is to flow from the network, based on source and destination addresses of the first block of data;

a feature data sender for sending the first feature data to the exit measuring probe;

a feature data receiver for receiving second feature data from another measuring probe, wherein the second feature data identifies a second block of data which flowed into the network at the other measuring probe;

a second feature data extractor for extracting third feature data from a third block of data flowing from the network, wherein the third feature data identifies the third block of data;

a comparator for comparing the third feature data with the second feature data to determine whether the third block of data is identical to the second block of data; and

a QoS calculator for calculating QoS based on the second and third feature data when it is determined that the third block of data is identical to the second block of data.

18. (Currently Amended) A measuring system for measuring quality of service (QoS) provided by a network composed of a plurality of sub-networks, through which ~~a block~~ one or more blocks of data each having at least source and destination addresses included therein ~~is~~ are transferred, the measuring system comprising:

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a plurality of measuring probes connected to respective ones of ~~[[the]]~~ a first edge node, ~~[[the]]~~ a second edge node, and at least one via-point node, the measuring probes being interconnected to each other,

wherein each of measuring probes connected to respective ones of the first and second edge ~~[[node]]~~ nodes comprises:

a first feature data extractor for extracting first feature data from a first block of data flowing into the network, wherein the first feature data identifies the first block of data;

a destination discriminator for determining an egress measuring probe at which the first block of data is to flow from the network and a via point measuring probe connected to a via-point node through which the first block of data is to pass, based on source and destination addresses of the first block of data;

a feature data sender for sending the first feature data to the egress measuring probe and the via-point measuring probe;

a first feature data receiver for receiving second feature data from an Ingress measuring probe, wherein the second feature data identifies a second block of data which flowed into the network at the ingress measuring probe;

a second feature data extractor for extracting third feature data from a third block of data flowing from the network, wherein the third feature data identifies the third block of data;

a first comparator for comparing the third feature data with the second data feature data to determine whether the third block of data is identical to the second block of data; and

a first QoS calculator for calculating QoS based on the second and third feature data when it is determined that the third block of data is identical to the second block of data, and

a via point measuring probe connected to each of the at least one via-point node, ~~comprises the via point measuring probe comprising:~~

a third feature data extractor for extracting fourth feature data from a fourth block of data passing the via-point node, wherein the fourth feature data identifies the fourth block of data;

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a second feature data receiver for receiving the fifth feature data from the ingress measuring probe, wherein the fifth feature data identifies a fifth block of data which flowed into the network at the ingress measuring probe;

a second comparator for comparing the fourth feature data with the fifth feature data to determine whether the fourth block of data is identical to the fifth block of data; and

a second QoS calculator for calculating QoS based on the fifth and fourth feature data when it is determined that the fifth block of data is identical to the fourth block of data.

19. (Currently Amended) A measuring system for measuring quality of service (QoS) provided by a network composed of a plurality of sub-networks, through which ~~a block~~ one or more blocks of data each having at least source and destination addresses included therein ~~is~~ are transferred, the measuring system comprising:

a plurality of measuring probes connected to respective ones of ~~[[the]]~~ a first edge node, ~~[[the]]~~ a second edge node, and at least one via-point node, the measuring probes being interconnected to each other,

wherein each of measuring probes connected to respective ones of the first and second edge nodes comprises:

a first feature data extractor for extracting first feature data from a first block of data flowing into the network, wherein the first feature data identifies the first block of data;

a first destination discriminator for determining an egress measuring probe at which the first block of data is to flow from the network and a via-point measuring probe connected to a via-point node through which the first block of data is to pass, based on source and destination addresses of the first block of data;

a first feature data sender for sending the first feature data to the egress measuring probe and the via-point measuring probe;

a feature data receiver for receiving second feature data from one of an ingress measuring probe and a via-point measuring probe, wherein the second feature data identifies a second block of data ~~which~~ captured at a corresponding one of the ingress measuring probe and the via-point measuring probe;

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a first buffer for storing the second feature data for the ingress measuring probe;

a second buffer for storing the second feature data for the via-point measuring probe;

a second feature data extractor for extracting third feature data from a third block of data flowing from the network, wherein the third feature data identifies the third block of data;

a comparator for comparing the third feature data with the second feature data to determine whether the third block of data is identical to the second block of data; and

a QoS calculator for calculating QoS based on the second and third feature data when it is determined that the third block of data is identical to the second block of data, and

a via-point measuring probe connected to each of the at least one via-point node, ~~comprises~~ the via point measuring probe comprising:

a third feature data extractor for extracting fourth feature data from a fourth block of data passing the via-point node, wherein the fourth feature data identifies the fourth block of data; and

a second feature data sender for sending the fourth feature data to the egress measuring probe.

20. (Original) The measuring system according to claim 19, wherein the comparator first compares the third feature data with the second feature data stored in the first buffer and then the third feature data with the second feature data stored in the second buffer.